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A Supported Approach For Agile Methods Adoption: A Case-Study

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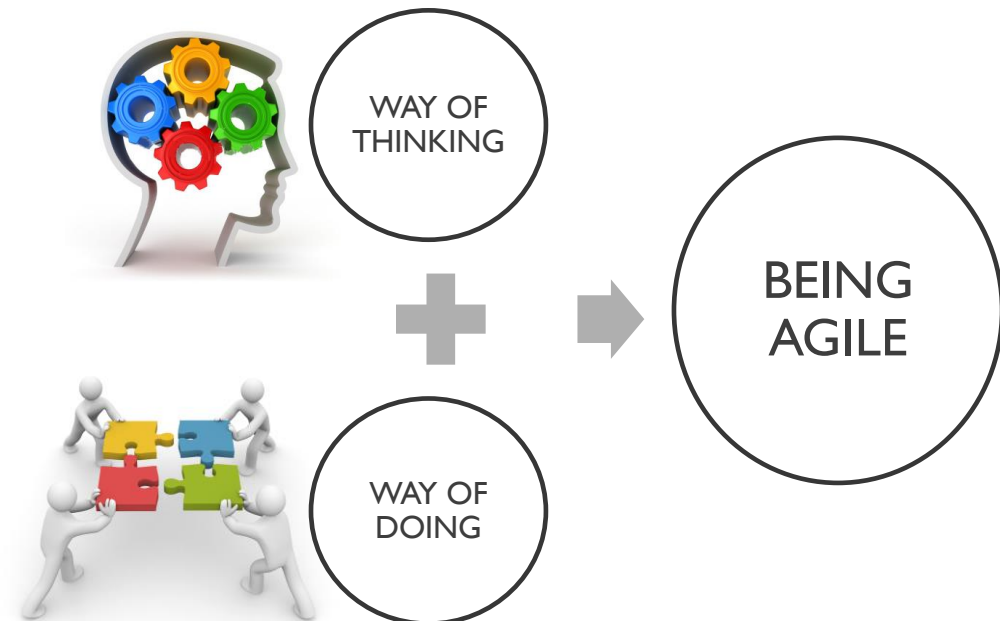
OVERVIEW

1. Problem Statement
2. Case-Study
 - Understand
 - Propose
 - Experiment
 - Support
3. Conclusion and Future Work

I. PROBLEM STATEMENT

- Agile Software Development (ASD) is still controversial
- Adopting ASD is a wide and complex organizational change

- It implies changes in both the :
 - **way of thinking** : Values + Principles
 - **way of doing** : Methods + Practices



I. PROBLEM STATEMENT

Observations Related to Agile Adoption :

- OB. 1 : **NARROW / RESTRICTED ADOPTION :**

- Generally only at Team - Project Level

- OB. 2 : **PROCESS WASTES :**

- Misapplication of practices
- Unused artefacts / Unnecessary practices
- Unconvinced individuals ...

➡ *the process is discarded overtime*

- OB. 3 : **“MONOLITHIC”** adoption :

- Same method for every project : No process adaptation according to specific contexts
- No process adaptation through iterations



Preliminary keys We consider

- KEY 1 : **HOLISTIC ADOPTION**

- Consider ASD as a **MATTER OF THE WHOLE ORGRANIZATION**
- Need to **spread the culture** at the organization level
- Need to **assess the readiness** of the organization and **evaluate risks**
- Agile experiences should be **capitalized**

- KEY 2 : Apply the **RIGHT = SUITABLE** process:

- **Customize** in order to fit the specific context
- **Continuously assess** ➡ **Continuously improve / evolve**



2. CASE STUDY : CONTEXT

■ ORGANIZATION CONTEXT :

- A middle-sized organization of **2,300 employees**
- IT service : **84 people**, mainly focused on the IT activities of the Walloon payment agency in Belgium
- 15 projects in progress
- **Five units organized by business roles** :Architecture, Quality insurance, Developers, Project managers,Analysis

■ FIRST PROJECT:

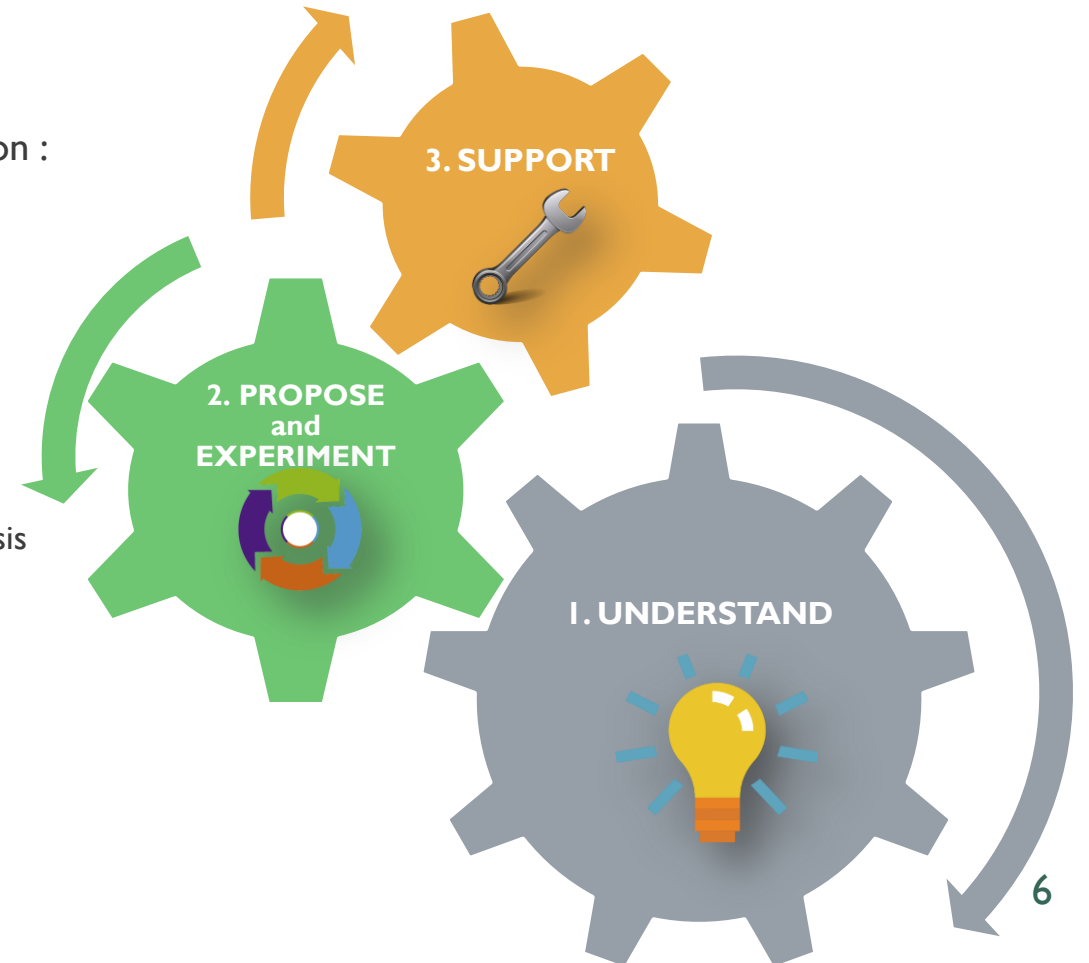
- **Bottom-up Agile adoption** : the project-team members are the initiators
- **Scrum at the team level**

■ SECOND PROJECT:

- Step-by-step transformation

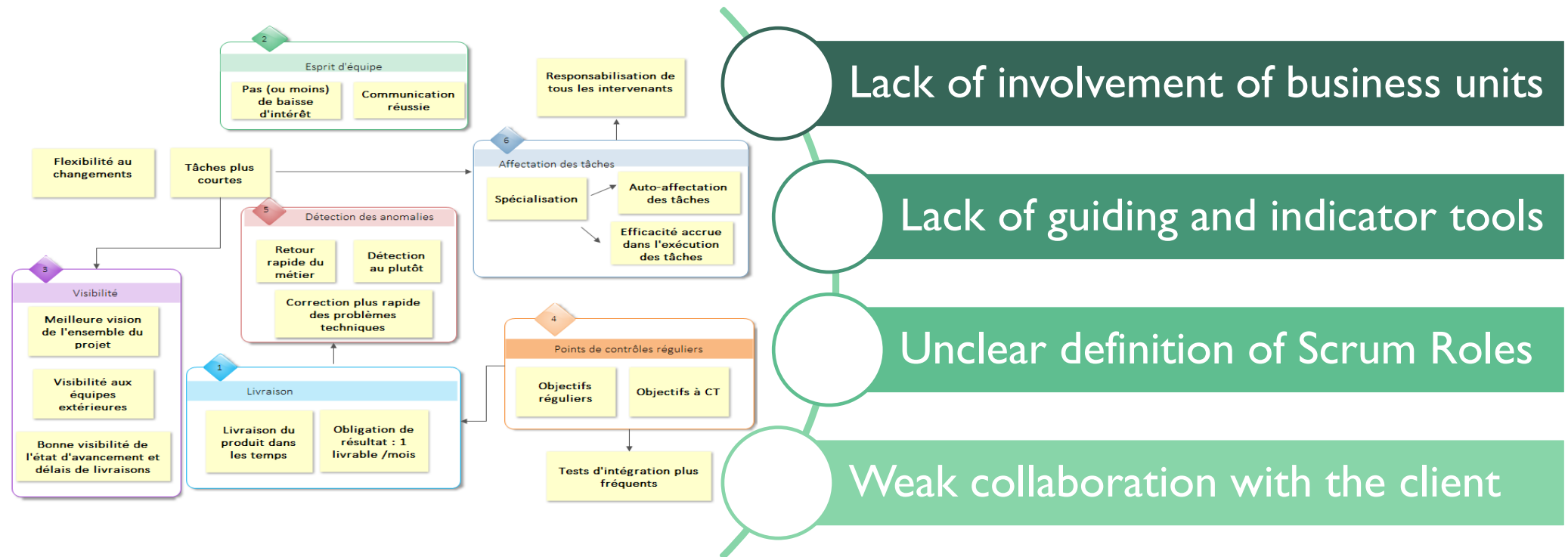
2. CASE-STUDY : METHODOLOGY

- STEP 1 : **UNDERSTAND** “in vivo” the key challenges of ASD adoption :
 - **TOOLS** : Project Retrospective (using affinity diagram) , 4-DAT methodology assessment
- STEP 2 : **PROPOSE** structured and systematic steps
- STEP 3 : **EXPERIMENT**:
 - **TOOLS** : Preliminary semi-structured interviews, Process surveys, Risk analysis (SWOT matrix, Radar chart of Agility Risk factors)
- STEP 3 : **SUPPORT** the approach with **objective guiding tools** :
 - to help through the **CUSTOMIZATION** of the process
 - to **ASSESS PROCESS SUITABILITY** and to enable its **REFINEMENT**



2. CASE-STUDY : UNDERSTAND (PROJECT I)

QUALITATIVE ANALYSIS Project Retrospective – Affinity Diagram



2. CASE-STUDY : UNDERSTAND (PROJECT I)

QUANTITATIVE ANALYSIS 4-DAT framework – dimension 2 (Qumer, 2007)

- 4-DAT (Qumer, 2007) :
 - Agility characterization : FY, SD, LS, LG, RS
 - If one phase or practice supports a particular agile feature allocate 1 , else 0
- Goal :
 - Evaluate the extent to which the process respects agile values
 - Compare Level of agility across business units

Table 2: Degree of agility in the applied method (4-DAT - Dimension 2)

Custom meth.	Agility features					Total
	FY	SD	LS	LG	RS	
<i>Phases</i>						
Business study (BA)	0	0	0	0	0	0
Pr. initiation (DEV)	0	0	0	0	0	0
Analysis (FA)	1	0	0	0	0	1
Design (AR)	1	0	0	0	1	2
Dev. sprints (DEV)	1	0	0	1	1	3
Testing (QA)	0	0	0	0	0	0
Final QA & release	0	0	0	0	0	0
Maintenance (SM)	1	0	0	0	0	1
Total	4	0	0	1	2	7
Agility degree	4/8	0/8	0/8	1/8	2/8	7/(8*5)
<i>DEV practices</i>						
Iterative incremental	1	1	0	1	1	4
Sustainable pace	1	1	0	1	1	4
Regular builds	1	1	0	1	1	4
Work specialisation	0	1	0	0	0	1
Sprint planning	1	1	1	1	0	4
Daily Scrum	1	0	0	1	1	3
Sprint review	1	1	0	1	1	4
Stories splitting	1	1	0	0	1	3
Total	7	7	1	6	6	27
Agility degree	7/8	7/8	1/8	6/8	6/8	27/(8*5)
<i>FA and AR practices</i>						
UC to US	0	0	0	0	0	0
Fine-grained stories	1	1	0	0	0	2
Arch. envisioning	1	0	0	1	1	3
Arch. iterations	1	1	0	1	1	4
Total	2	1	0	3	2	9
Agility degree	2/5	1/5	0/5	3/5	2/5	9/(5*5)


Table 3: Degree of agility in Scrum and the customised method

Process	Scrum	Customised method
Phases	0.6	0.17
Practices	0.8	Dev. unit : 0.67 Other units : 0.36

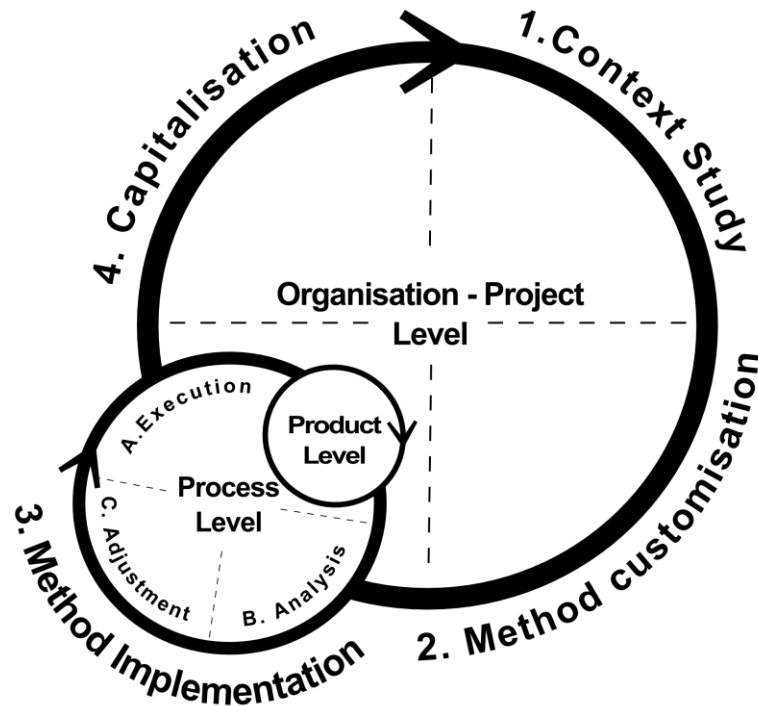
2. CASE-STUDY : UNDERSTAND (PROJECT I)

KEY FINDINGS

- The applied process do not provide **satisfactory and coherent** level of agility :
 - high coupling with other non-agile units
 - practices were chosen according to preferences and not context suitability

 Investigate structured and context-oriented adoption steps to guide and assist agile adoption efforts

2. CASE-STUDY : PROPOSE



- **AM-QuICK Framework**

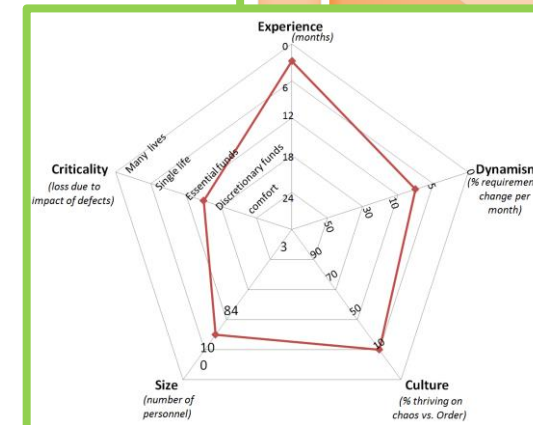
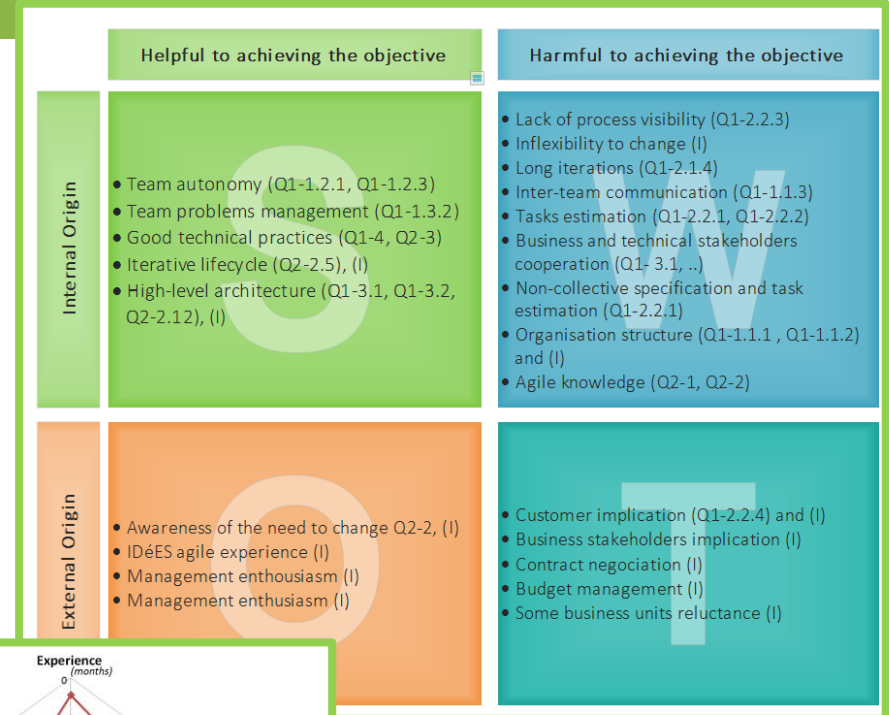
- **Proposed structured steps (based on QIP):**

1. **Context analysis** : characterize the context through interviews, GQM-based diagnosis, risk assessment tools, etc.
2. **Customized agile method design** : Selection of suitable practices, Method Composition
3. **Implementation** : Enactment of the designed method (Process level), analysis of feedback to allow later adjustments
4. **Capitalization** : Future incoming projects have to profit from the gained experience

2. CASE-STUDY : EXPERIMENT (PROJECT 2)

CONTEXT STUDY

- **Semi-structured Interviews :**
 - 1h – 2h per. Business role unit
- **2 questionnaires :**
 - 15 project teams
 - 1st Questionnaire : **Analyze the current process** in terms of agility degree : Team organization, Project management, Requirements analysis, Development practices
 - 2nd Questionnaire : **Identify the desired and/or applicable agile practices**
 - **64 participant**
 - **74 % participation rate**



2. CASE-STUDY : EXPERIMENT (PROJECT 2)

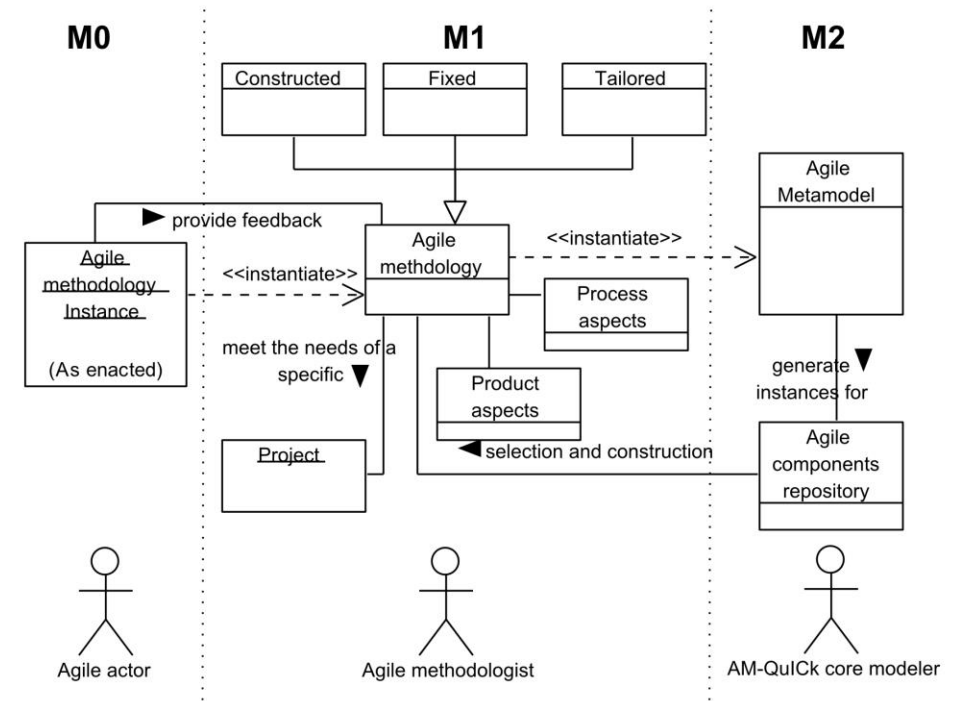
KEY FINDINGS

- The context analysis helped in the customization process :
 - Based on the results : implementation of a **project-wide methodological backlog** : prioritization of actions to be undertaken in order to guarantee that specific agile practices would be applicable and efficient
- However the result of the context study are still **difficult to exploit in a systematic manner.**

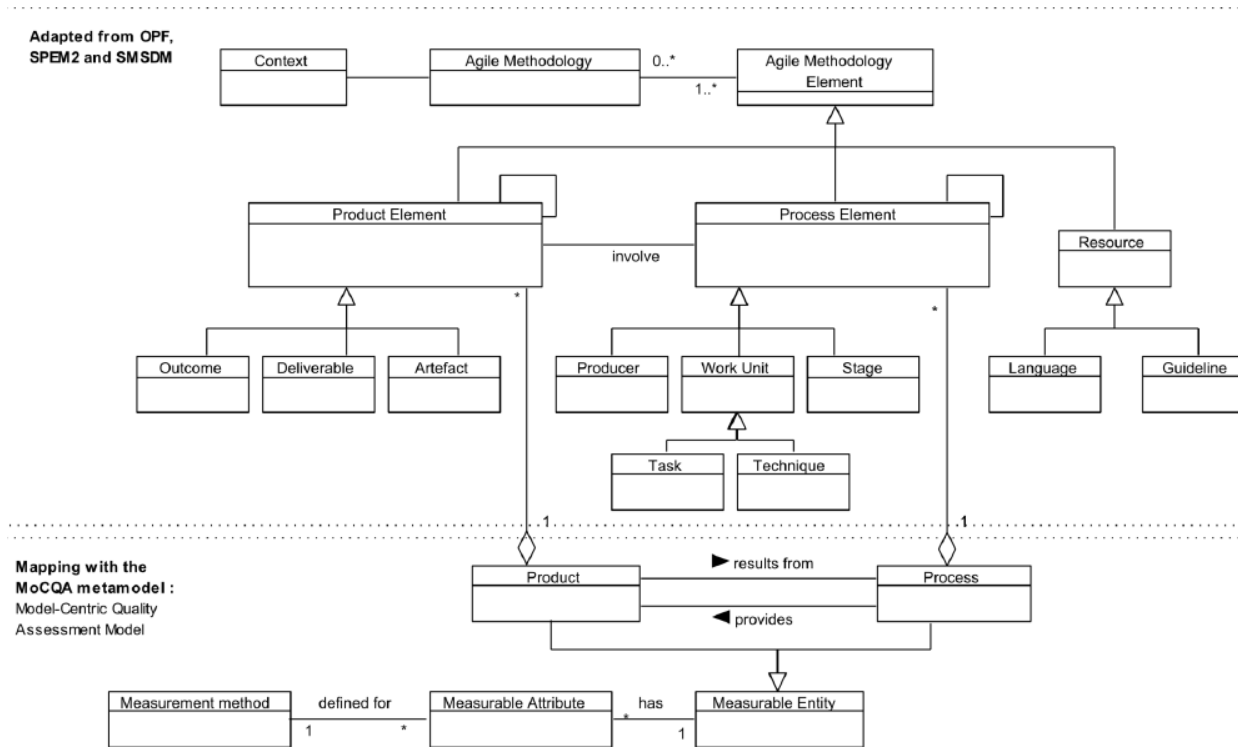
➡ Need to support the approach, to automate it

2. CASE-STUDY : SUPPORT

- **Situational ME**
- **AM-QuICK** aims at continuously assist during :
 - **Design of the customized method** by elements composition
 - **Process Refinement (evolution – co-evolution with the product)** thanks to quality assessment

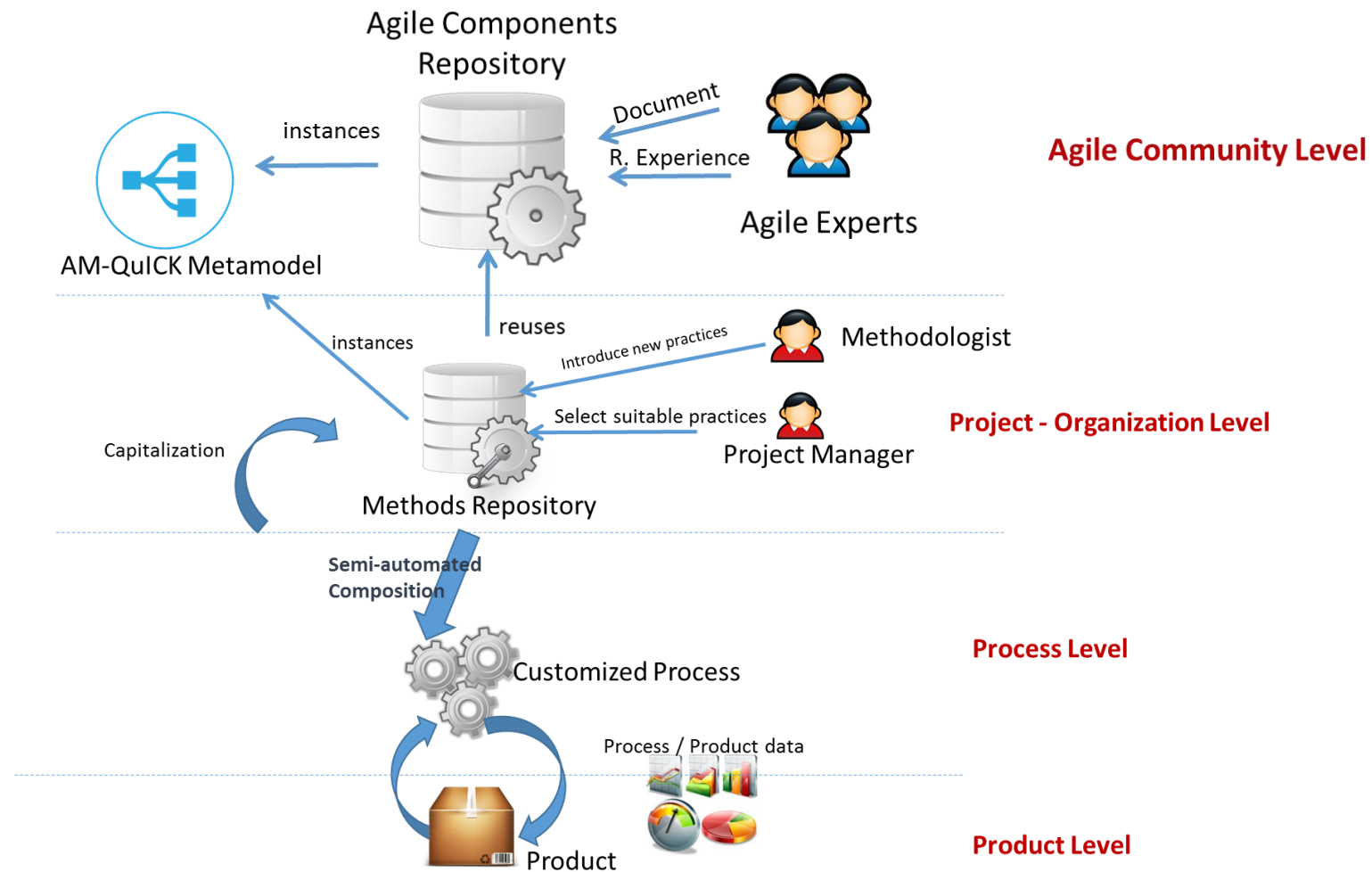


2. CASE-STUDY : SUPPORT



- AM-QuICK proposes a metamodel which serves as a guide for agile methods design
 - Adapted from SPEM 2.0 and ESSENCE 1.0
- Integrated a quality assessment metamodel (MoCQA)

2. CASE-STUDY : SUPPORT



3. CONCLUSION

CHALLENGES :

- **Supporting** the Agile process adoption
 - **Analyze and model** the organization context
 - **Customize** accordingly
 - **Continuously assess** : Change is inevitable : the **enacted agile process should evolve incrementally**, just like the software evolve
 - **Capitalize**

RESEARCH DIRECTION :

- **Creating** a reusable framework to support adoption efforts
- Development of a **Methods Repository** (i.e., catalogue of reusable agile product and process elements, metrics, practices, tools ...)
- Development of an **model-driven** and **automated composer** to guide the decision-making :
 - Need to capture the relationship between **methods components**
 - Need to enrich the metamodel with **Context Modeling** in order to be able to capture the Organization and Project context
- Need of a Knowledge DB for **the refinement and assessment rules** :
 - **Constraints definition** in order to capture the **dynamic behavior** between its elements so that it will be able to represent the interaction between product / process elements , and therefore their co-evolution



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